New Software Tool Identifies Opportunities for Energy Savings in Galvanizing Lines

ITP researchers have developed a comprehensive engineering-based energy evaluation model to quantitatively determine energy and productivity based benefits resulting from the implementation of improved pot hardware materials in galvanizing lines. The software tool allows for input of extensive time sensitive data of energy costs, energy consumption of line equipment, campaign information, material life information, and production and rejection information as shown below.

Inputs to Software

- Monthly energy costs and usage
- Operating parameters for motors
- Electricity consumption
- Natural gas consumption
- Production and rejection quantities

Outputs from Software

- Energy consumption
- Production summary
- Productivity estimates
- Hardware failure data
- Sensitivity analysis data

The model then calculates and produces detailed reports on electricity and natural gas consumption for various product types and production quantities, along with information on aspects of the galvanizing process such as resulting energy savings, product losses, and productivity rates as shown above and in

Figure 1.

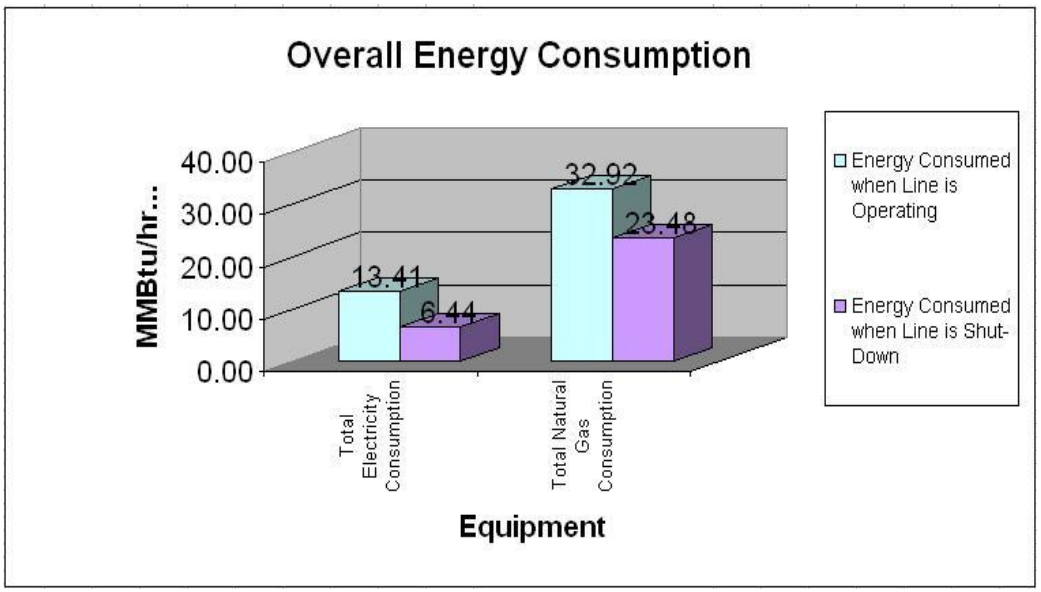
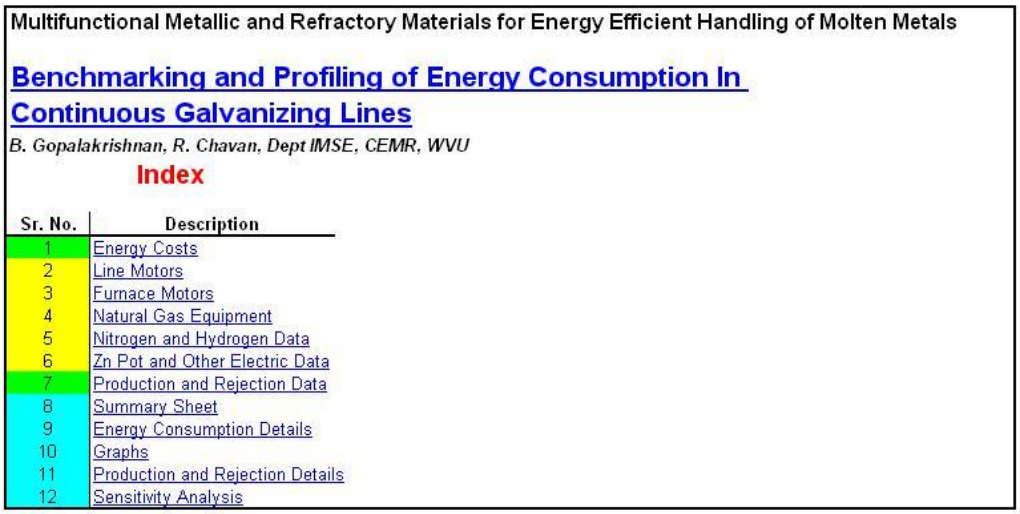


Figure 1. Energy Consumption Plot

The model can also derive accurate values of energy consumed per ton of production, and can calculate both economic impact and return on investment for investments in newer improved pot hardware materials.

A screen shot of the tool front end is shown in Figure 2.


Multifunctional Metallic and Refractory Materials for Energy Efficient Handling of Molten Metals

Benchmarking and Profiling of Energy Consumption In Continuous Galvanizing Lines

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Figure 2. Energy Tool Front End

The model has been used to report a current energy consumption of approximately 21 trillion Btu per year from 57 continuous galvanizing lines in the nation. This analysis also shows there a potential energy savings of almost 18 trillion Btu per year that will result from new materials being developed by WVU, ORNL, and UMR through a current DOE EERE Industrial Technologies Program (ITP) project entitled “Multifunctional Metallic and Refractory Materials for Energy Efficient Handling of Molten Metals”. The concepts used in developing the model for new pot hardware materials for galvanizing lines are currently being extended to the determination of energy savings resulting from implementing improved refractory materials in aluminum reverberatory furnaces. When complete the model will be posted on the DOE ITP web site.

A fact sheet on this project is available at:
http://www.eere.energy.gov/industry/imf/pdfs/16943_metallic_and_refrac.pdf

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